

Claims 3-10 have been rejected under 35 U.S.C. 112, based upon the claims referring to "apparatus" instead of to the expression "tool" used in Claim 1. Claims 3-10 have been amended as suggested by the Examiner. Claim 7 has been amended to more clearly provide an antecedent basis for "pumping pressure strokes." Accordingly, Claims 3-10 are now believed to fully comply with the requirements of 35 U.S.C. 112.

Claims 1-4 have been rejected under 35 U.S.C. 102 based upon United States Patent No. 5,337,819 to Roger Tailby, the Examiner alleging in substance that the Tailby reference has means for closing the downward jet and opening the upper jet as specified in the claimed combination. This rejection is respectfully traversed.

As a starting point, it is respectfully submitted that the Tailby tool is a so-called washing, or de-scaling tool, well known in the art, which is typically run through various tubular goods which are contacted by reservoir fluid and which generates scaling on the interior of the tubular goods, for example, steel casing which is already cemented in place within an earth borehole. Such scaling is typically generated from calcium carbonate or the like.

In sharp contrast, the present invention is a float shoe/collar tool for use while the casing is being run into the well. The two types of tools essentially have nothing to do with each other. One (Tailby) is used to clean up the interior of the casing after it has been cemented into the well and the one according to the present invention is used inside the casing while the casing is being run into the borehole.

Quite aside from the fact that the tools of the present invention perform totally different functions from the tools of the Tailby reference, the ways in which the tools are structured is totally different. The Examiner's attention is respectfully directed to **FIG. 2 and 4** of the Tailby reference.

In FIG. 2, there are two upwardly facing jets 22A and 26A. In a similar manner there are two downwardly facing jets 22B and 26B. In comparing FIG. 2 and FIG. 4 of the cited Tailby reference, one in which the internal sleeve 12 is moving back and forth, it is readily seen that there is no point in time when the upward jets of Tailby can be closed while opening the downward jets and no point in time when the downwardly facing jets can be closed while opening the upwardly facing jets. Thus, as between the two upwardly facing jets 22A and 26A, one is always going to be closed and one is always going to be opened regardless of whether the sleeve 12 has moved one direction or the other, and the same is true for the two downwardly facing jets 22B and 26B.

Referring now to the specific language of Claim 1, the claim calls for the upwardly facing fluid jets to be initially closed by the inner member during the casing string run in. That is a physical impossibility to do or be performed by the tools described in the Tailby reference. In a similar manner, Claim 1 also calls for the movement of the inner sleeve to cause the downwardly facing jets to close and for the upwardly facing jets to open. This is a physical impossibility with the Tailby reference. The Tailby reference is always going to have upward jets that are open, downward jets that are open, upward jets that are closed, and downward jets that are closed. This is easily confirmed by referring to FIG. 2 and 4 of the Tailby reference. Accordingly, the applicant submits that Claims 1-4 are not fully met by the Tailby reference, either as to structure or as to function, and the applicants respectfully request that the rejection of Claims 1-4 based upon the Tailby reference be withdrawn.

Claims 1-10 have been rejected under 35 U.S.C. 103a as being unpatentable over United States Patent No. 4,469,174 to Tommie A. Freeman, taken alone, or in the alternative in view of the Tailby reference discussed above. This rejection is respectfully traversed

As a starting point, the tool illustrated in **FIG. 4** of the Freeman reference, the only embodiment, has a single orifice 64 which in no way functions in the same manner as the downwardly facing jets in accordance with the present invention. The Examiner's attention is respectfully directed to **FIG. 3** of the Freeman reference in which all of the cement is illustrated as being above the confines of the cement basket. As noted in Column 2, line 8 of the Freeman reference, the fluid actually enters the orifice 64 from the borehole, and is not used as an exit jet. For example, in Column 2, commencing at line 7, we find the language "as the casing is lowered into the well bore with the combination cementing shoe and basket of the present invention at its lower end, the casing fills automatically through an orifice in the nose at the bottom of the mandrel. This is the orifice 64. This is not a downwardly facing jet.

Moreover, as the Examiner has acknowledged, the Freeman patent also has no upwardly facing jet. The only jet that is above the orifice 64 is a circumferential jet 48 which is neither facing upward or downward. In operation of the device of the Freeman reference, after the casing is filled from the well bore fluid coming through the orifice 64, the ball is dropped and enables the cement to then be pumped out through the ports 48, but only circumferentially.

Thus, it is readily seen that the tool illustrated and described within the Freeman reference has no relationship to the present invention and has neither upwardly facing jets nor downwardly facing jets. This, in summary, is an indication that not only is the Freeman tool totally different in function but is totally different in structure. The applicant therefore respectfully requests that the rejection of Claims 1-10 based upon the Freeman reference, taken alone, should be withdrawn.

Moreover, there is nothing to indicate that the combination of the Freeman reference with the above discussed Tailby reference would produce the present invention. The applicants therefore

respectfully requests that the rejection of Claims 1-10 based upon Freeman alone, or in combination with Tailby be withdrawn.

The Examiner has also indicated that the prior art made of record and not relied upon, namely United States Patent No. 5,474,130 to Thomas C. Davis, is considered pertinent to the applicant's disclosure, the Examiner alleging in substance that Davis teaches a well tool having upwardly and downwardly facing jets. It should be appreciated that the Davis tool embodied within the Davis patent is also a casing cleaning tool used to clean the interior of casing which has already been cemented in, much like the patent above discussed with respect to Tailby. The Davis reference, while using upwardly facing jets and downwardly facing jets, not only has no means to close one off while opening the other, but would defeat his purpose if he had such a device. The Davis tool has a pair of upwardly facing jets 26 and a pair of downwardly facing jets 34. When the tool is run into an earth borehole, a sleeve 38 is held in place by a shear screw 50. In the operation of the Davis tool, as soon as the jets 26 and 34 are in proximity to the perforations in the casing, a dart valve 50 is dropped through the interior of the tool, causing the shear screw 50 to shear and thus cause the sleeve 38 to fall down to a position such as is illustrated in FIG. 5 of the Davis patent, and thus allows fluid to be pumped through the jets 26 and 34. In this operation, the jets 26 and 34 are either closed because of the sleeve 38 or are both open as the result of movement of the sliding sleeve 38. As soon as the cleaning operation has concluded, the dart valve 58 is used to lift the sleeve back up to its "up-well" position as is illustrated in FIG. 7 of the Davis patent. The operation of the Davis tool in no way contemplates either the upwardly facing jets or the downwardly facing jets being opened while the other one is closed. The Davis patent makes use of the fact that when fluid is flowing through both of the jet ports, the flow causes an area of reduced pressure to form between the upper

and lower sets of ports. This is pointed out in Column 1 lines 47-50 of the Davis patent. This could not possibly happen if, i.e. there could be no area of reduced pressure, if one of the sets of ports were open and one of the sets of ports were closed.

In summary, it is respectfully submitted that the applicant has developed an improvement in the cementing art which is fully defined by the claims in this application, and it is submitted that these claims are neither fully met nor made obvious by any of the art of record, alone or in combination, for all of the reasons as set forth above. The applicants therefore respectfully requests that the rejections of Claims 1-10 be withdrawn and that these claims be advanced to issue. In addition, Claims 11-14, newly added, are believed to also distinguish over the art of record and a favorable consideration of these claims is respectfully requested.

If the Examiner is of the opinion that it would be helpful in the advancement of the prosecution of this application to have a telephone interview with the undersigned counsel for thawed applicant, such a conference would certainly be welcomed.

2 Nov. 2001  
Date

Respectfully,  
The Matthews Firm



Guy E. Matthews  
Reg. No. 24,173  
1900 West Loop South, Suite 1800  
Houston, Texas 77027  
(713) 355-4200 Telephone  
(713) 355-9689 Facsimile

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The invention may be best understood by reference to the detailed description thereof which follows and by reference to the appended drawings. The drawings are intended to be illustrative of the preferred embodiment of the invention but are not intended to be limitative of the invention as it may admit to more than one embodiment. It is to be understood that the valves of the float shoe and valves in the float collar may be the same.

"WELL COMPLETION CONVERTIBLE FLOAT/SHOE COLLAR"

Inventors: Musselwhite, et al

**CLAIMS**

What is claimed is:

1. A well completion float shoe/collar tool comprising:

an outer tubular member and an inner tubular member, said outer tubular member having both upwardly facing and downwardly facing fluid jet openings, said upwardly facing fluid jet openings being initially closed by said inner member during casing string run in;

said inner tubular member having a bore there through initially open to fluid flow and permitting fluid flow to said downwardly facing fluid jet openings; and

means for causing longitudinal movement of said inner member with respect to said outer member, said movement causing said downwardly facing jets to close and said upwardly facing jets to open.

2. A well completion float shoe/collar tool comprising:

an inner tubular member and an outer tubular member, said outer tubular member having both upwardly and downwardly facing fluid jet openings therein; and means for selectively closing one or the other of said fluid jet openings.

3. The [apparatus] tool of claim 2 wherein said means for selectively closing comprises means for causing relative motion of said inner member with respect to said outer member.
4. The [apparatus] tool of claim 3 wherein said relative motion comprises longitudinal relative motion.
5. The [apparatus] tool of claim 4 wherein said longitudinal relative motion is caused by means of obturating an internal passage of said inner member.
6. The [apparatus] tool of claim 5 wherein said obturating means includes a ball pumped down under fluid pressure from the surface of the earth to said tool.
7. (Amended) The [apparatus] tool of Claim 1 and further including pressure pumping apparatus at the earth's surface generating pumping pressure strokes, and said tool also including valve means, activated by said movement, to prevent fluid from re-entering said outer and inner tubular members between pumping pressure strokes.
8. The [apparatus] tool of claim 7 wherein said valve means comprises one or more one way flow check valves.
9. The [apparatus] tool of claim 8 wherein said check valves comprise flapper type valves.

10. The [apparatus] tool of claim 9 wherein said flapper valves are held in their open position during casing run in.

--11. An improved float shoe/collar apparatus for use during running of casing including inner and outer tubular members moveable relative to each other, at least one valve opened when running the casing, and closed when cementing the casing to prevent encroachment of fluid back into the casing.

12. The apparatus of Claim 11 further comprising a release apparatus mounted with the inner and/or outer tubular members relative to each other for releasing the movement of the inner tubular member and/or the outer tubular member longitudinally relative to each other.

13. An improved float shoe/collar apparatus for use during running of casing, comprising: inner and out tubular members moveable relative to each other, a plurality of valves opened when running the casing, and closed when cementing the casing to prevent encroachment of fluid back into the casing.

14. Float collar/shoe equipment for use in lowering a tubular string into a wellbore and cementing the tubular string in position, comprising:

an outer tubular member affixed to said tubular string;  
an inner tubular member moveable between a first position and a second position with respect to said outer tubular member;

a plurality of one-way valves positioned between said inner tubular member and said outer tubular member, said plurality of one-way valves having a plurality of closure elements and a plurality of valve seats, said inner tubular member being positioned in said first position such that said inner tubular member extends through said plurality of one-way valves and covers said plurality of valve seats and maintains said plurality of closure elements in an open position such that fluid may flow through said plurality of one-way valves in two directions, said inner tubular member being moveable to thereby uncover said plurality of valve seats and permit said closure elements to close such that said plurality of one-way valves then permit fluid flow in only one direction--.

The invention may be best understood by reference to the detailed description thereof which follows and by reference to the appended drawings. The drawings are intended to be illustrative of the preferred embodiment of the invention but are not intended to be limitative of the invention as it may admit to more than one embodiment. It is to be understood that the valves of the float shoe and valves in the float collar may be the same.

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1. A well completion float shoe/collar tool comprising:  
an outer tubular member and an inner tubular member, said outer tubular member having both upwardly facing and downwardly facing fluid jet openings, said upwardly facing fluid jet openings being initially closed by said inner member during casing string run in;  
said inner tubular member having a bore there through initially open to fluid flow and permitting fluid flow to said downwardly facing fluid jet openings; and means for causing longitudinal movement of said inner member with respect to said outer member, said movement causing said downwardly facing jets to close and said upwardly facing jets to open.
2. A well completion float shoe/collar tool comprising:  
an inner tubular member and an outer tubular member, said outer tubular member having both upwardly and downwardly facing fluid jet openings therein; and means for selectively closing one or the other of said fluid jet openings.
3. The tool of claim 2 wherein said means for selectively closing comprises means for causing relative motion of said inner member with respect to said outer member.

4. The tool of claim 3 wherein said relative motion comprises longitudinal relative motion.
5. The tool of claim 4 wherein said longitudinal relative motion is caused by means of obturating an internal passage of said inner member.
6. The tool of claim 5 wherein said obturating means includes a ball pumped down under fluid pressure from the surface of the earth to said tool.
7. The tool of Claim 1 and further including pressure pumping apparatus at the earth's surface generating pumping pressure strokes, and said tool also including valve means, activated by said movement, to prevent fluid from re-entering said outer and inner tubular members between pumping pressure strokes.
8. The tool of claim 7 wherein said valve means comprises one or more one way flow check valves.
9. The tool of claim 8 wherein said check valves comprise flapper type valves.
10. The tool of claim 9 wherein said flapper valves are held in their open position during casing run in.

11. An improved float shoe/collar apparatus for use during running of casing including inner and outer tubular members moveable relative to each other, at least one valve opened when running the casing, and closed when cementing the casing to prevent encroachment of fluid back into the casing.

12. The apparatus of Claim 11 further comprising a release apparatus mounted with the inner and/or outer tubular members relative to each other for releasing the movement of the inner tubular member and/or the outer tubular member longitudinally relative to each other.

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14. Float collar/shoe equipment for use in lowering a tubular string into a wellbore and cementing the tubular string in position, comprising:

an outer tubular member affixed to said tubular string;

an inner tubular member moveable between a first position and a second position with respect to said outer tubular member;

a plurality of one-way valves positioned between said inner tubular member and said outer tubular member, said plurality of one-way valves having a plurality of closure elements and a plurality of valve seats, said inner tubular member being positioned in said first position such that

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Inventors: Musselwhite, et al

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said inner tubular member extends through said plurality of one-way valves and covers said plurality of valve seats and maintains said plurality of closure elements in an open position such that fluid may flow through said plurality of one-way valves in two directions, said inner tubular member being moveable to thereby uncover said plurality of valve seats and permit said closure elements to close such that said plurality of one-way valves then permit fluid flow in only one direction..

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